

REMARKS

1. Claims 1, 3, 5, 9, 11, 13, 15 and 20 are pending in the application. Claim 21 is new. No new matter has been added.
2. Claims 1, 3, 5, 9, 11, 13, 15 and 20 stand rejected under 35 U.S.C. §112, first and second paragraphs.
3. Claims 1, 3, 5, 7, 11, 15 and 20 also stand rejected under 35 U.S.C. §103 for obviousness over Japanese patent publication no. 56-121462 (Hoashi *et al.*) in view of US patent publication no. 6,537,494 (Garlick) and further in view of US published patent application no. 2002/0192340 (Swart *et al.*), as evidenced by Merriam-Webster's Online Dictionary.
4. Claim 13 also stands rejected under 35 U.S.C. §103 for obviousness over Japanese patent publication no. 56-121462 (Hoashi *et al.*) in view of US patent publication no. 6,537,494 (Garlick), US published patent application no. 2002/0192340 (Swart *et al.*) and US patent publication no. 6,248,986 (Tran *et al.*).

Amendments

5. Claim 1 is amended to specify gas-containing microbubbles “having a diameter of 50 μm or less”. The basis for this amendment is provided by the discussion of the term “microbubbles” on page 4, paragraph 3 of the English translation of the description.
6. Claim 1 is further amended to reinstate the words “of the fish-paste product” in the first reference to “raw materials”. The term “raw materials of the fish-paste product” were present in original Claim 1 and so this amendment does not add new matter.
7. Claim 1 is further amended to specify, in the step of “coating interfaces...”, “creating coating shells composed of said protein and lipid to maintain the ozone gas-containing

microbubbles for 2 to 50 hours". The basis for this amendment is provided by page 6, paragraph 3 of the English translation of the description.

8. Claim 1 is further amended to refer to "sterilizing the raw materials" in the step of "giving a first stimulation", rather than sterilizing the fish-paste product. The basis for sterilizing the raw materials in this manner is provided by page 7, paragraph 3 and page 8, paragraph 1 of the English translation of the description.

9. Claim 1 is further amended to delete the phrase "in the state of final product". It is submitted that amended claim 1 distinguishes between "the fish-paste product" and "the raw materials of the fish paste product" and so the phrase "in a state of final product" is superfluous.

10. Claim 9 is amended so that the phrase "tentatively stabilized by the coating shells at the step of pestling of the raw materials" now reads "during the step of pestling the raw materials". The phrase "tentatively stabilized by the coating shells" was inserted in the previous amendment and so its deletion does not result in new matter.

11. Claim 11 is amended to specify that the second stimulation comprises high-frequency irradiation of "the fish-paste product", instead of "raw materials containing the ozone gas-containing microbubbles". The basis for this amendment is provided by page 10, paragraph 6 to page 11, paragraph 1 of the English translation of the description, which reads "Stimulation in this stage is preferably high-frequency irradiation or microwave irradiation mentioned above because the fish-paste product has been packaged".

12. Also in Claim 11, the phrase "tentatively stabilized by the coating shells" is deleted. The phrase "tentatively stabilized by the coating shells" was inserted in a previous amendment and so its deletion does not result in new matter.

13. Claim 13 is amended to specify that the second stimulation comprises microwave irradiation of "the fish-paste product", instead of "raw materials containing the ozone gas-containing microbubbles". The basis for this amendment is provided by page 10, paragraph 6 to

page 11, paragraph 1 of the English translation of the description, as quoted in paragraph 11 above.

14. Also in Claim 13, the phrase “tentatively stabilized by the coating shells” is deleted. The phrase “tentatively stabilized by the coating shells” was inserted in a previous amendment and so its deletion does not result in new matter.

15. Claim 15 is amended to specify that “the first stimulation comprises heating the raw materials containing the ozone gas-containing microbubbles”. The basis for this amendment is provided by page 9, paragraph 3 of the English translation of the description, which reads “The method of stimulating the microbubbles by heating raw materials of a fish-paste product is a method wherein coating shells of the microbubbles are ruptured by utilizing the vibration of molecules in the raw materials of a fish-paste product upon direct heating of the raw materials of a fish-paste product”.

16. Also in Claim 15, the phrase “tentatively stabilized by the coating shells” is deleted. The phrase “tentatively stabilized by the coating shells” was inserted in a previous amendment and so its deletion does not result in new matter.

17. New Claim 21 specifies “a method for producing a fish-paste product”, comprising the steps of:

- adding ozone gas-containing microbubbles generated in water to raw materials of the fish-paste product;

The basis for this step is provided by page 5, paragraphs 2 and 3 of the English translation of the description, in conjunction with steps S101 and S102 of Figure 6;

- coating interfaces of the ozone gas-containing microbubbles with protein and lipid in the raw materials, thereby creating coating shells composed of said protein and lipid;

The basis for this step is provided by page 5, paragraph 4 to page 6, paragraph 3 of the English translation of the description, in conjunction with step S103 of Figure 6;

- rupturing the coating shells of a portion of the ozone gas-containing microbubbles in the raw materials to form active oxygen and free radical species, thereby sterilizing the raw materials;

The basis for this step is provided by page 7, paragraph 2 of the English translation of the description, in conjunction with step S105 of Figure 6;

and

- rupturing the coating shells of another portion of the ozone gas-containing microbubbles after processing and packaging the fish-paste product to form further active oxygen and free radical species, thereby sterilizing the fish-paste product”;

The basis for this step is provided by page 10, paragraphs 5 and 6 of the English translation of the description, in conjunction with step S109 of Figure 6.

Rejection under 35 U.S.C. §112, first and second paragraphs

18. The Examiner’s rejection of Claim 1 based on the previous deletion of the words “of a fish-paste product” has been addressed by reinstatement of the full term “raw materials of a fish-paste product”, as discussed in paragraph 6 above.

19. The Examiner also considered the presentation in Claim 1 of the step of “pestling the raw materials of the fish-paste product after the step of adding the ozone gas-containing microbubbles” as separate from “giving a first stimulation to a part of the ozone gas-containing microbubbles” to lack support from the description. Claim 1 specifies “coating interfaces of the ozone gas-containing microbubbles... during the step of pestling thereby creating coating shells” and then “giving a first stimulation to a part of the ozone gas-containing microbubbles thereby rupturing the coating shells”. While Claim 9 specifies a method in which first stimulation is given during the step of pestling, the description discloses other suitable techniques. For example, page 8, paragraph 3 reads:

“The method of stimulating the ozone gas-containing microbubbles in the present invention is carried out preferably by rubbing together raw materials of a fish-paste product at the time of pestling the raw materials, by high-frequency irradiation or microwave irradiation of raw materials of a fish-paste product or by heating raw materials of a fish-paste product”.

Moreover, Figure 6 depicts an embodiment in which the coating of the microbubbles (step S103) occurs before stimulation of a part of the microbubbles and rupture of coating shells (steps S104 and S105). For these reasons, it is requested that the Examiner reconsider this rejection.

20. The Examiner also rejected Claim 1 for lack of support for the pestling step being performed after “adding the ozone gas-containing microbubbles...” and before “coating interfaces of the ozone gas-containing microbubbles...” It is requested that the Examiner reconsider this objection, since the coating of the interfaces must take place after the adding of the microbubbles and the description provides support for the coating of the interfaces and the giving of the first stimulation being separate processes, for example, on page 8, paragraph 3 as quoted in paragraph 19 above. It is further noted that Figure 6 depicts an embodiment in which the coating of the microbubbles (step S103) occurs after the adding of the microbubbles (step S102) and before stimulation of a part of the microbubbles and rupture of coating shells (steps S104 and S105).

21. Also regarding Claim 1, the Examiner also considered the previous addition of “giving a second stimulation to another part of the ozone gas-containing microbubbles...” and “thereby further sterilizing the fish-paste product...” to lack support and clarity, since the raw materials of the fish-paste product had been sterilized prior to processing. Such further sterilization is supported by the description, for example, on page 10, paragraph 2, where it is disclosed that:

“the sterilizing action is continued even in the process for producing a fish-paste product. That is, the sterilizing effect is continued throughout a period from the processing (production) of the fish-paste product (S106) to the packaging of the fish-paste product (S107)”.

It is submitted that the phrase “further sterilizing” in Claim 1 is, thus, supported and clear in the context provided by the specification.

22. Further regarding Claim 1, the Examiner considered the second stimulation “while processing and packaging the fish-paste product” to be unsupported. In paragraph 4 of the Office Action, the Examiner states that “the secondary stimulation appears to occur after packaging”. However, the description does, in fact, support stimulation of microbubbles during processing and packaging, for example, on page 10, paragraph 2, as quoted in paragraph 21 above.

23. Also in Claim 1, the Examiner considered the phrase “wherein the fish-paste product... has an effect of being sterilized in a state of final-product” to be unclear. This rejection has been addressed by deleting the phrase “in a state of final-product”.

24. Claims 9, 11, 13 and 15 stand rejected under 35 U.S.C. §112, first and second paragraphs as the Examiner considers the references to “ozone gas-containing microbubbles tentatively stabilized by the coating shells” to lack support and to be unclear. This rejection has been addressed by deletion of the phrase “tentatively stabilized by the coating shells”.

25. Claims 11 and 13 also stand rejected under 35 U.S.C. §112, first paragraph as the Examiner considers the reference to the “second stimulation” in relation to “the raw materials”, previously inserted into those claims, to lack support. This rejection has been addressed by amending Claims 11 and 13 to refer to “the fish-paste product”, rather than “the raw materials”.

26. Claim 15 also stands rejected under 35 U.S.C. §112, first paragraph as the Examiner considers “heating raw materials” to lack support in the context of “the second stimulation”. These rejections have been addressed by amending Claim 15 to refer to “the first stimulation” instead of “the second stimulation”.

Rejection under 35 U.S.C §103

27. The Examiner considered the method of Claim 1 as previously presented to be obvious over Hoashi in view of Garlick and further in view of Swart, as evidenced by Merriam-Webster's Online Dictionary.

28. Hoashi discloses a method of preparing a fish-paste product, in which fish meat is blended and minced in the presence of ozone and then sterilized. The ozone is provided in gaseous form. However, Hoashi does not disclose the following features of present Claim 1:

- a) "utilizing gas-containing microbubbles having a diameter of 50 μm or less";
- b) the ozone gas-containing microbubbles being "generated in water"
- c) "coating interfaces of the ozone gas-containing microbubbles with protein and lipid in the raw materials... thereby creating coating shells composed of said protein and lipid to maintain the ozone gas-containing microbubbles for 2 to 50 hours";
- d) "giving a first stimulation to a part of the ozone gas-containing microbubbles thereby rupturing the coating shells of the ozone gas-containing microbubbles while said ozone gas-containing microbubbles are in the raw materials, thereby sterilizing the fish-paste product raw materials by the formation of active oxygen and free radical species"; and
- e) "giving a second stimulation to another part of the ozone gas-containing microbubbles while processing and packaging the fish-paste product, thereby further sterilizing the fish-paste product by the further formation of active oxygen and free radical species, wherein the further formation of active oxygen and free radical species kill germs contaminated to the raw materials in the producing process of the fish-paste product, and wherein the fish-paste product is germ-free and has an effect of being sterilized".

29. The Examiner considered features (a), (b), (c) and (d) to be taught by Garlick. However, Garlick does not disclose each of these features, as will now be explained.

30. In one technique taught by Garlick, an "ozone fog" of "highly ozonated water" droplets is created. Ultrasonic waves can be used to cause undissolved bubbles in the ozone fog to divide

(column 4, lines 19 to 30 of Garlick). In other words, this teaching from Garlick uses stimulation only to cause division of the bubbles and does not disclose, envisage or suggest “coating interfaces of the ozone gas-containing microbubbles with protein and lipid in the raw materials... thereby creating coating shells composed of said protein and lipid” (specified in feature (c)) or “rupturing the coating shells of the ozone gas-containing microbubbles” (specified in feature (d)) as required by present Claim 1.

31. In a second technique taught by Garlick, a food product is immersed in highly ozonated water. Column 5, lines 26 to 38 of Garlick disclose the use of “ultrasonic scrubbers that agitate the food product surface microcavities to allow for deeper penetration of the highly concentrated ozonated water”. However, this part of Garlick’s teaching does not specify the size of ozone gas-containing bubbles in the highly ozonated water. Furthermore, the “agitation of the food product surface microcavities to allow for deeper penetration” of Garlick is not equivalent to “coating interfaces of the ozone gas-containing microbubbles with protein and lipid in the raw materials”, since there is nothing to suggest that such coating occurs.

32. Therefore, the second technique taught by Garlick does not include or suggest “utilizing gas-containing microbubbles having a diameter of 50 μm or less” (feature (a)), “coating interfaces of the ozone gas-containing microbubbles with protein and lipid in the raw materials... thereby creating coating shells composed of said protein and lipid” (specified in feature (c)), “rupturing the coating shells of the ozone gas-containing microbubbles while said ozone gas-containing microbubbles are in the raw materials (specified in feature (d)), as required by present Claim 1.

33. For the sake of completeness, it is noted that neither of the techniques taught by Garlick envisage or suggest “giving a second stimulation to another part of the ozone gas-containing microbubbles while processing and packaging the fish-paste product” (feature (e)) as required by present Claim 1.

34. Therefore, even if it were obvious to combine selected features of the teachings of Hoashi and Garlick, the resulting combination would lack at least features (c), (d) and (e) of present

claim 1.

35. The Examiner considered the step of “giving a second stimulation” to be obvious in view of Swart. Swart teaches the application to an anti-microbial agent to a food product by spraying or by immersion therein and then irradiating the food product. However, Swart does not disclose the provision of such agents in the form of microbubbles. In addition, paragraph [0069] of Swart teaches “irradiating a food product employing any method or apparatus known in the art for irradiating a food product, either before or after treatment with an antimicrobial agent”. In other words, Swart teaches stimulation of the food product in connection as unconnected with treatment with an anti-microbial agent.

36. Consequently, Swart cannot render obvious “giving a second stimulation to another part of the ozone gas-containing microbubbles while processing and packaging the fish-paste product, thereby further sterilizing the fish-paste product by the further formation of active oxygen and free radical species” (feature (e)) as required by present Claim 1. Moreover, Swart does not envisage or suggest features (a), (b), (c) or (d) of present Claim 1.

36. The combined teachings of Hoashi, Garlick and Swart do not provide each of the features of present Claim 1. In view of this, Applicant submits that the method of Claim 1 is patentable over the cited art and should be allowed by the Examiner.

Claims 3, 5, 9, 11,15 and 20

37. Applicant submits that Claims 3, 5, 9, 11,15 and 20 are also allowable at least by virtue of their dependency on Claim 1 as well as the additional limitations recited by each of these claims.

Claim 13

38. The method of Claim 13 is allowable at least by virtue of its dependency on Claim 1 as well as its additional limitation. It is noted that the teaching of Tran would not assist a skilled person to devise a method comprising all of features (a), (b), (c), (d) and (e) based on Hoashi, Garlick and Swart.

Claim 21

38. New Claim 21 recites a method having steps that are related to features (a), (b), (c), (d) and (e) of present Claim 1. In view of this, it is submitted that new Claim 21 does not disclose new subject matter or require a further search of the prior art and it is requested that the Examiner considers its patentability.

39. It is further submitted that the method of Claim 21 is new and is not obvious for the reasons discussed above in relation to Claim 1, since Claim 21 includes limitations relating to each of features (a), (b), (c), (d) and (e).

40. In view of the above, Applicants submit that the application is now in condition for allowance and respectfully urges the Examiner to pass this case to issue.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

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